CONSTRUCTION OF A COMPREHENSIVE ANTI-DOPING KNOWLEDGE TEST PURSUANT WITH NATIONAL ANTI-DOPING RULES FOR ATHLETES AND ATHLETE SUPPORT PERSONNEL

A Synopsis

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GWALIOR (M.P.) INDIA

By

Name : DHIRENDER KUMAR TOKAS

Registration No. : PH-2016/89

Under the supervision of

1. Dr. Madan Singh Rathore

Assistant Professor, Department of Exercise Physiology, LNIPE, Gwalior

2. Dr. Kulvinder Singh Bagga

Professor, Faculty of Physical Education, KRTT College, Mathura

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DEPARTMENT OF EXERCISE PHYSIOLOGY

Certificate

I hereby declare that the synopsis titled "**CONSTRUCTION OF A COMPREHENSIVE ANTI-DOPING KNOWLEDGE TEST PURSUANT WITH NATIONAL ANTI-DOPING RULES FOR ATHLETES AND ATHLETE SUPPORT PERSONNEL**" being submitted in partial fulfilment of the requirement for the degree of Doctor of Philosophy in Physical Education under the Department of Exercise Physiology of Lakshmibai National Institute of Physical Education, Gwalior during the academic year 2022-23. It is a bonafide record of original work carried out under the supervision of Dr. Madan Singh Rathore and Prof. Kulvinder Singh Bagga and has not been submitted in full or part to any other university or institute for a degree or diploma. Further, it is certified that the short synopsis is plagiarism-free.

Mr. Dhirender Kumar Tokas

PH/2016/89

1. Dr. Madan Singh Rathore

   Assistant Professor, Department of Exercise Physiology

   LNIPE, Gwalior

2. Prof. Kulvinder Singh Bagga

   Professor, Faculty of Physical Education

   KRTT College, Mathura

(Chairman, DRC)

(Director, R & D Cell)

ABSTRACT

Education constitutes a lifelong and multidimensional process, fostering the physical, intellectual, moral, economic, and spiritual development of individuals with the objective of nurturing ethically grounded and socially responsible citizens. Within this paradigm, Physical Education (PE) serves as a vital conduit, advancing health, well-being, and self-discovery through structured movement.

Assessment, particularly in the form of standardized testing, holds a central role in formal education systems by systematically evaluating knowledge, skills, and cognitive competencies. In the domain of anti-doping, such knowledge assessments have emerged as indispensable instruments for gauging athletes' comprehension of regulatory frameworks and for appraising the efficacy of educational interventions.

This research endeavors to design and validate a psychometrically sound and pedagogically robust anti-doping knowledge assessment tool, congruent with the tenets of the World Anti-Doping Code and its International Standard for Education. The latter emphasizes education not merely as a regulatory mechanism, but as a foundational strategy to engender long-term cultural change in sport by promoting integrity, informed decision-making, and adherence to clean sport values.

Situated within the national context of India, the study evaluates the educational outreach of the National Anti-Doping Agency (NADA), an autonomous body instituted in 2005 under the aegis of the Ministry of Youth Affairs and Sports. Through the development of a comprehensive questionnaire grounded in NADA's educational directives, the study aims to measure knowledge levels among athletes and support personnel across diverse cohorts.

The tool aspires to serve not only as a diagnostic measure but also as a strategic asset for enhancing educational programming, monitoring pedagogical outcomes, and informing future anti-doping research and policy. Ultimately, this investigation contributes to the global discourse on clean sport by offering a replicable model for knowledge assessment within anti-doping education.

KEYWORDS - ANTI-DOPING, KNOWLEDGE TEST, ATHLETES, ATHLETE SUPPORT PERSONNEL, NATIONAL ANTI DOPING AGENCY, WORLD ANTI DOPING AGENCY, SPORTS, VALUES, FAIR PLAY, ANTI DOPING RULE VIOLATIONS, TESTING, THERAPEUTIC USE EXEMPTION, EDUCATION, DOPING CONTROL

CHAPTER 1

INTRODUCTION

1.1 Knowledge Testing in Physical Education

Education, outspreading beyond traditional academic realms, is a cornerstone of societal evolution and individual progress. Physical education has long been recognized as a fundamental part of a comprehensive education. Physical education is similar to other core topics in that it follows the same structure of assessment and evaluation; however, unlike other courses, the majority of coursework is completed by participation rather than study.

Physical education and sports knowledge testing methods differs slightly from standard knowledge testing in other disciplines of education. Physical education knowledge test approach is centred on the development of particular knowledge examinations. A range of exams, including essay tests, true-false items, discrimination tests, item analysis tests, multiple choice item tests, matching item tests, objective testing, short answer items, and sports knowledge tests, among others. Such assessments are intended to assess theoretical knowledge in areas such as character development, fitness, health, and sports skills.

Test and measurement are pivotal in the educational system, serving as tools to evaluate student learning, inform teaching practices, and assess the effectiveness of educational programs. In the current push to raise educational standards, standardised testing has taken the stage. More and more researchers have been keen on developing standardized testing methodology in the recent and Testing is widely seen by many policymakers as a significant, beneficial, and affordable tool for improving education. Knowledge testing in physical education and sports is a way to assess students' understanding of the concepts and skills related to these subjects. Knowledge tests can be used to measure a variety of things, such as students' understanding of the rules of a sport, their knowledge of the health benefits of physical activity, or their ability to identify different types of muscles.

There are a variety of different ways to create knowledge tests for physical education and sports. Some common types of knowledge tests include:

- Multiple choice tests
- True/false tests
- Fill-in-the-blank tests
- Short answer tests
- Essay tests

Knowledge testing can be a valuable tool for assessing students' learning in physical education and sports. However, it is important to note that knowledge tests are not the only way to assess student learning. Other methods of assessment, such as performance tests and observation, can also provide valuable information about students' progress.

Here are some of the benefits of using knowledge testing in physical education and sports:

- Knowledge tests can help to ensure that students are learning the important concepts and skills related to these subjects.
- Knowledge tests can provide a standardized way to assess student learning. This can be helpful for comparing student progress over time or across different classes.
- Knowledge tests can help to identify students who may need additional support in learning the material.

Knowledge testing is a research method that is used to assess the knowledge of participants on a specific topic. Knowledge tests can be used to measure a variety of things, such as:

- The level of knowledge that participants have about a particular subject
- The changes in knowledge that occur over time
- The differences in knowledge between different groups of people

Knowledge tests can be administered in a variety of ways, such as:

- In person
- Over the phone
- Online

The format of a knowledge test can also vary, but it typically includes a series of questions that participants must answer. The questions can be multiple choice, true/false, or short answer.

Knowledge testing can be a valuable research tool for a variety of purposes. It can be used to assess the knowledge of participants on a specific topic, to measure the changes in knowledge that occur over time, and to identify the differences in knowledge between different groups of people.

Here are some examples of how knowledge testing has been used in research:

- A study of the knowledge of high school students about climate change found that students had a limited understanding of the causes and effects of climate change.
- A study of the knowledge of medical professionals about the use of opioids found that many professionals were not aware of the risks associated with opioid use.

- A study of the knowledge of the public about the dangers of smoking found that many people were not aware of the health risks associated with smoking.

Knowledge testing can be a valuable tool for researchers who are interested in understanding the knowledge of participants on a specific topic. Knowledge tests are pivotal in anti-doping research, providing a reliable means to evaluate athletes' comprehension of anti-doping rules and procedures. For instance, before athletes can participate in international competitions, they might be subjected to these tests to confirm their awareness of prohibited substances and the intricacies of the doping control process.

For researchers, knowledge tests are invaluable in assessing the impact and efficacy of anti-doping education. These tests provide insights into how well athletes understand and comply with anti-doping regulations, which is essential for developing and refining educational strategies. By continuously monitoring and analysing test results, researchers can guide the evolution of anti-doping education, ensuring that it remains relevant and effective in promoting fair play and integrity in sports.

Construction of a Test : - Tests are constructed to measure a concept, knowledge or attitude of subjects for a specific segment of the population. Before developing any test, one should know what information is required and how quickly it is needed. One should also ascertain about the cost involved in gathering the information related to the test so developed. The test construction involves few steps which are explained below.

Steps in Test Construction : The following steps are imperial for a researcher to construct a knowledge test:

1. **Determining The Objectives –** This is the first and foremost important step while preparing a knowledge test as it ensures the proper planning of the rest of the steps.

2. **Content analysis -** It is a method of collecting all the relevant items that measure the identified concept or phenomena for which the test is being constructed. In doing so, views of all the experts are taken on the issue. The information obtained from the review of literature becomes the initial source for making the draft in the test construction. The content analysis ensures that the developed test measures the concept correctly for which it is developed. After the completion of these two steps, the researcher must completely ensure that correct action plan is made and most importantly the test measures the concept as well as the specific objectives.

3. **Action Plan –** The final Action Plan is initiated by specifically deciding and defining the population by delimiting the sample through various sampling methods.

4. **Constructing the Test Items –** It is one of the most challenging and time-consuming steps, requiring careful consideration of order, flow, language, level of target accomplishment, clarity etc. Choose whether your questionnaire should include open ended or closed ended questions. Some researchers may opt for assorted and hybrid approach but in any case, the objectives of the test must be met and fulfilled. Once everything has been finalized, the final assessment of various methods the analyse the test items and decision about the item scoring methodology is made.

5. **Pilot Study –** A pilot study is usually an important phase in scientific research, but it is especially crucial in survey research. It is sometimes advised to perform a dual trial run. Conduct a pilot survey with a representative group of stakeholders that is similar to the main survey. The pilot outcomes should be continuously analysed.

6. **Analysis of Trial Outcomes –** It is the first level analysis of test items. If the findings of the pilot research require significant revisions, it is advised to conduct another pilot study to ensure the questionnaire is appropriate.

7. **Second item review:** After obtaining the result in the first trial run, a careful examination of each test item is done by a group of experts. Items which do not perform as expected can be discarded or revised. Reviewing the items twice in this manner decreases the likelihood of false items in the test.

8. **Item Analysis –** The questionnaire is administered, and the findings are subjected to item analysis. Questions with uniform responses should be assessed as they may lack discrimination.

9. **Determining the Reliability and Validity of the Test –** Calculating reliability and validity is another critical stage in developing an effective knowledge test or questionnaire.

10. **Preparing The Final Report –** The culmination of all the efforts lies in the meticulous creation of the knowledge test's final report. Therefore, the structured creation of the final report is not merely a formality but a critical step that encapsulates the entire test development process, from conception to implementation (Thomas et al., 2022) (Verma, 2019).

1.2 Doping in Sports and Anti-Doping Organizations

Doping is the term used to describe the use of chemicals by athletes to acquire a competitive edge that are illegal according to the anti-doping organisations. The widespread use of doping goods and procedures has an

impact not only on the health of the athletes, ut also on the perception of sport, as sport is crucial for both physical and mental education as well as for fostering international understanding and cooperation. Doping is thus prohibited in sports for moral and therapeutic grounds alike.

"Doping in sport" means the occurrence of any Anti-Doping Rule Violations as specified under (Government of India. (2022). *THE NATIONAL ANTI-DOPING ACT, 2022*. MINISTRY OF LAW AND JUSTICE (Legislative Department)).

Doping in sport is a widespread problem not just among elite athletes, but even more so in recreational sports.

Anti-Doping Education: Delivering training on anti-doping topics to build competencies In clean sport behaviours and make informed decisions.(WADA. (2021). *INTERNATIONAL STANDARD FOR EDUCATION*. World Anti-Doping Agency Stock Exchange Tower 800 Place Victoria (Suite 1700) PO Box 120 Montreal, Quebec Canada H4Z 1B7. www.wada-ama.org)

An Anti-Doping Organization's Education program shall include the following awareness, information, values-based and Education components which shall at a minimum be available on a website.

- Principles and values associated with clean sport
- Athletes', Athlete Support
- Personnel's and other groups' rights and responsibilities under the Code
- The principle of Strict Liability
- Consequences of doping, for example, physical and mental health, social and economic effects, and sanctions
- Anti-doping rule violations
- Substances and Methods on the Prohibited List
- Risks of supplement use
- Use of medications and Therapeutic Use Exemptions
- Testing procedures, including urine, blood and the Athlete Biological Passport
- Requirements of the Registered Testing Pool, including whereabouts and the use of ADAMS

- Speaking up to share concerns about doping WADA. (2021). (*World Anti-Doping Code*. World Anti-Doping Agency. www.wada-ama.org)

The National Anti-Doping Programme

The National Anti-Doping Agency [NADA] was established by the Government of India, with the objective of acting as the independent Anti-Doping Organization for India having a vision of dope free sports. The NADA has the necessary authority and responsibility for:

- Planning, coordinating, implementing, monitoring and advocating improvements in Doping Control;
- Cooperating with other relevant national organizations, agencies and other Anti-Doping Organizations;
- Encouraging reciprocal Testing between National Anti-Doping Organizations;
- Promoting anti-doping research;
- Where funding is provided, withholding some or all funding, during any period of his or her ineligibility, to any Athlete or Athlete Support Personnel who has violated anti-doping rules;
- Vigorously pursuing all potential anti-doping rule violations within its jurisdiction including investigating into whether Athlete Support Personnel or other Persons may have been involved in each case of doping.
- Planning, implementing and monitoring anti-doping information and education programs. (*National Anti-Doping Agency—Vision*. (n.d.). Retrieved May 19, 2023, from https://www.nadaindia.org/en/vision)

Anti-doping research contributes to the development and implementation of efficient programs within Doping Control and to information and Education regarding doping-free sport. Relevant anti-doping research may include, for example, sociological, behavioural, juridical and ethical studies in addition to scientific, medical, analytical, statistical and physiological investigation. (WADA. (2021). *World Anti-Doping Code*. World Anti-Doping Agency. www.wada-ama.org)

1.3 Statement of the Problem

The current study attempts to create a legitimate and accurate method for assessing knowledge and understanding of knowledge regarding doping. The problem under investigation is titled "**CONSTRUCTION OF A COMPREHENSIVE KNOWLEDGE TEST PURSUANT WITH NATIONAL ANTI DOPING CODE FOR ATHLETES AND ATHLETE SUPPORT PERSONNEL".**

1.4 Research Question

The following are the research questions and objectives identified to be answered through the study:

- To construct a reliable knowledge test for athletes and athlete support personnel.
- To construct a valid knowledge test for athletes and athlete support personnel.

1.5 Delimitations

This study is delimited to the following:

1. The study is delimited to construction of knowledge test for athletes and athlete support personnels only.
2. The study is delimited to 1000 athletes only.
3. The study is delimited to 200 athlete support personnel only.
4. The study is delimited to athletes of age 13-25 only.
5. The study is delimited to the use of certain item difficulty and discrimination index.
6. The study is delimited to use certain statistical methods for establishing reliability and validity of the test.

1.6 Limitations

In the current study, variables like academic success, educational paths of the subjects, conjectured responses, and subject intelligence might impose some restrictions and may have an impact on the overall findings and final draft, but these are identified as constraints outside the researcher's control.

1.7 Hypothesis

1. The newly developed comprehensive knowledge test for athletes and athlete support personnel may be reliable to test the overall important constructs identified as variables.

2. The newly developed comprehensive knowledge test for athletes and athlete support personnel may be valid to test the overall important constructs identified as variables.

1.8 Definitions and Explanation of Terms

Knowledge Test :- Knowledge test is one of the sound tool to assess the knowledge of various stakeholders like customers, farmers, students etc. The methodology behind development of knowledge test is very important for social science research. (Barua, n.d.)

Doping :- Administration or use of agents deemed as prohibited according to the WADA prohibited list.

NADA :- National Anti-Doping Agency, independent Anti-Doping Organization for India having a vision of dope free sports.

WADA :- World Anti-Doping Agency, an international independent agency to lead a collaborative worldwide movement for doping-free sport.

Athlete :- Any person who competes in any sport at the national level or international level or participates in any competition or event.

Athlete Support Personnel :- any coach, trainer, manager, agent, team staff, official, medical or paramedical personnel or such other person working with or treating or assisting an athlete who is participating in, or preparing for, a competition or event at the national level or international level.

Code :- the World Anti-Doping Code adopted and amended from time to time by the World Anti-Doping Agency.

Doping Control :- All steps and processes from test distribution planning up to the disposal of any appeal and enforcement of consequences, including all steps and processes in between, including but not limited to, testing, investigation, whereabouts, Therapeutic Use Exemptions, sample collection and handling, laboratory analysis, Results Management, hearings and appeals, and investigations or proceedings relating to an Anti-Doping Rule Violation;

Prohibited List :- The list of prohibited substances and prohibited methods specified by the Agency by regulations.

Testing :- The parts of the doping control process involving test distribution planning, sample collection, sample handling, sample transport to the laboratory and testing of samples;

Use :- The utilisation, application, ingestion, injection or consumption by any means whatsoever of any prohibited substance or prohibited method;

1.9 Need & Significance of the Study

- The need as well as significance of the present study lies in its uniqueness. So far comprehensive knowledge test based on various educational constructs has not been standardized and validated.

- It will be one of its kind comprehensive questionnaire, valid and reliable in its standardization process that acknowledges all the major factors identified by national anti-doping agency in their doping education plan and content shared by the organization.
- As a nationwide organization having a strong vision of dope free sports, this current study will surely aid NADA in recognizing the successful achievement of their continuous efforts in Planning, implementing and monitoring anti-doping information and education programs, delivering training on anti-doping topics to build competencies in clean sport behaviour and make informed decisions as well as promoting anti-doping research.
- Moreover, the current study might also contribute as a tool to assess doping knowledge among various sub samples occurring within the large pool of athletes and support personnel likewise.
- The comprehensive knowledge test can be used as a model for further researches.

CHAPTER II

REVIEW OF RELATED LITERATURE

Kannan, S., Naha, A., Singh, R. R., Bansal, P., Nayak, V. C., Goud, S., & Rani, U. (2021). A Descriptive Cross-sectional Study of Knowledge of Doping at Grassroot Level in India. ***Research Journal of Pharmacy and Technology*****,** ***14*****(12), 6587–6591. https://doi.org/10.52711/0974-360X.2021.01139** conducted a study on PETs of India using questionnaire developed by WHO. Doping is termed as the use of banned drugs or methods to increase an athlete's performance and the concealment or attempted concealment of such use. Doping is a significant issue in the world of athletics. This study aims to assess doping knowledge among school physical education teachers (PET) of one sample district of Karnataka, India. Descriptive research was conducted using a cross-sectional, complete enumeration approach with 308 PET The questionnaire developed by World Anti-Doping Agency (WADA) was approved for use in testing doping knowledge. Descriptive statistics, Fisher's exact test and Kruskal-Wallis test were used to explain PET demographic variables and knowledge assessment. Out of 308, one hundred ninety-three (62.66%) are males with an average age of 45.61 ± 8.33 and One hundred fifteen (37.34%) respondents were females with a mean age of 44.69 ± 8.36 years. 268 PET has Poor knowledge (87%), 27 PET has Intermediate knowledge (9%), and 13 High knowledge (4%) of doping. The current study findings highlighted a lack of knowledge of PET in the aspect of Doping. Physical Education Teachers play a vital role to train and mentor younger children at sports in schools. Training physical education teachers in Doping will help create awareness and sustainable education about anti-doping practices among children.

Jural, L. A., Soares, T. R. C., Coqueiro, R. da S., Rabello, T. B., Pithon, M. M., & Maia, L. C. (2021). Development, validation and application of a Brazilian knowledge scale about sports doping in dentistry. ***Brazilian Oral Research*****,** ***35*****, e110. https://doi.org/10.1590/1807-3107bor-2021.vol35.0110** also tried to construct a similar case named as B-KSSDD. To evaluate the knowledge of Brazilian dentists of sports doping through the development, validation and application of the Brazilian Knowledge Scale about Sports Doping in Dentistry (B-KSSDD). A scale with 12 items was developed to assess a dentist's ability to determine whether the use of a medication characterised sports doping according to the World Anti-Doping Agency. A preliminary study to validate the B-KSSDD was carried out with 135 dentists, allowing the evaluation of ceiling and floor effects, convergent and discriminant validity, test-retest reliability and internal consistency of the instrument. A sample size calculation using the results of the preliminary study and the B-KSSDD was completed online using SurveyMonkey® by 270 participants from all regions of the country. The B-KSSDD showed evidence of convergent and discriminant validity, good temporal stability (ICC = 0.75) and internal consistency (alpha = 0.89). In the main study, the participants obtained an average score of 4.19/12 points on the B-KSSDD,

suggesting that these professionals have insufficient knowledge about sports doping. The age of participants showed a negative association with knowledge about doping, while frequency of treating athletes and frequency of performing surgeries showed positive associations with knowledge about doping. The dentists had insufficient knowledge of the subject. Age of participants and frequency with which they attend to athletes are associated with knowledge about sports doping. Professional updating and education policies on doping are necessary for dentists, as athlete patients are at risk for severe sporting and financial penalties.

Dincer, N., & Demir, H. (2013). The determination of knowledge levels related to doping in elite athletes. ***Turkish Journal of Sport and Exercise*****,** ***15*****(2), Article 2. https://doi.org/10.15314/tjse.23606** also tested knowledge relating to doping methods of which aren't specified. The aim of the study was to the determine knowledge level related to doping in athletes who performed individual sports. The sample of the research consists of 117 national level athletes (62 wrestlers, 29 teakwondo players and 26 judoists). A personal information form and a questionnaire which aim to determine the athletes' knowledge levels and opinions about doping and ergogenic supply were carried out for the athletes participated in the research as a means of data collection. The reliability and validity of the questionnaire were realized by Eröz. The chi-square test was performed to compare variables. A significant difference was found between the sports branches about whether they intend to use doping for higher performances ($X2 = 26.764$; $p < 0.01$). A significant difference was found between sport branches about whether the athletes intend to use doping due to the fear of losing ($X2 = 43.207$; $p < 0.01$). The athletes' views about whether they intend to use doping in order to control their excitement were different between the sport branches ($X2 = 59.035$; $p < 0.01$). Opinions about whether the athletes had enough knowledge about doping were different between the sport branches ($X2 = 16.955$; $p < 0.05$). The athletes' opinions about doping damages to health were found to be significant between the sport branches ($X2 = 13.742$; $p > 0.05$). The athletes, who participated in this study, did not have enough knowledge about doping. Therefore, it may be thought that they are inclined to use doping.

Dubey, D. K. (2016). Construction of Comprehensive Knowledge Test For Kho Kho Player s. ***University*****. https://shodhganga.inflibnet.ac.in:8443/jspui/handle/10603/476920** also used similar mechanism in his attempt to construct kho kho knowledge test. His initial draft consisted of 80 items and final draft remained for 43 items.

Voss, T., Kunter, M., & Baumert, J. (2011). Assessing teacher candidates' general pedagogical/psychological knowledge: Test construction and validation. ***Journal of Educational Psychology*****,** ***103*****, 952–969. https://doi.org/10.1037/a0025125**

Teachers' general pedagogical/psychological knowledge (PPK) can be defined as the knowledge needed to create and optimize teaching–learning situations across subjects, including declarative and procedural knowledge of classroom management, teaching methods, classroom assessment, and student heterogeneity. Although PPK is thought to be an important aspect of teacher quality, it has seen little empirical investigation—

largely because no direct and valid measure of PPK has previously been available. Study 1 describes the development of a 39-item measure using multiple-choice items, short-answer items, and video-based items to assess PPK. Experts rated the items to be relevant for teaching and domain general. Study 2 provides further evidence for the measure's validity. Data obtained from 746 German teacher candidates supported the hypothesized nomological network of PPK; the measure was sensitive to differences between groups; and variations in PPK did not overlap to any great extent with variations in discriminant constructs such as general reasoning abilities, personal beliefs, and domain-specific knowledge. Furthermore, PPK was positively associated with indicators of instructional quality from the students' perspective. (PsycINFO Database Record (c) 2016 APA, all rights reserved)

Kaur, G., & Singh, G. (n.d.). CONSTRUCTION OF ACHIEVEMENT TEST IN SCIENCE. ***MALWA JOURNAL OF EDUCATION*****, *1*(13), 45.** The investigator under the Punjab School Education Board has created and standardized the Science achievement test for class IX. The steps involved in creating an achievement test for science include planning, getting ready, choosing the items, testing, scoring, and item analysis. After consultation with experts and administration on students, the test's original 92 items were cut to 77. A draught of 62 test items was produced after the problematic test items were removed. The test's final version had 45 items after a thorough item analysis. The test retest reliability of the test after a gap of 20 days was found to be 0.83. The content validity was ascertained by preparing a blue print of the test items indicating the weightage given for the objectives and discussing it with the panel of experts. 65 minutes was established as the test's time limit.

Ahmad, Shahzad & Jamil, Sadia (n.d.). ***Analysis of Test Items used in an Achievement Test in Physics at Secondary Level*****. Retrieved May 19, 2023, from https://core.ac.uk/reader/234642510** Aim of present study was the analysis of test items constructed in an achievement test in the subject of physics for class IX. It was used to study the difficulty level, discrimination power and distracter analysis of each test item. The achievement test was comprised of 40 multiple choice questions. Test was administered by researcher on a sample of 250 students from Islamabad Model Schools in Sector G-9. Findings of the study showed that most of the test items fall in acceptable range of difficulty index and discrimination power. In keeping view, the findings of the study, researcher comes to know that most of the test items prove to be satisfactory regarding difficulty index and discriminating power. However, ten out of forty test items were discarded due to high or very low level of

difficulty and poor discrimination power. This work is equally significant for the researchers and for the subject teachers in preparing achievement tests in order to assess performance of students with optimum level of difficulty index and discriminating power.

CHAPTER III

METHODOLOGY

The main objective of the study is to construct a valid and reliable comprehensive doping knowledge test for athletes and athlete support personnel. To fulfill the objective, following methodological steps will be used:

3.1 Selection of Participants

To choose athletes from around the country, a multistage sampling method will be employed. Five zones—North, South, Central, East, and West—are used to categorize the population of the entire nation. A total of 1000 samples, 200 from each zone, will make up the sample size. In order to meet the requirement of choosing athletes between the ages of 13 and 25, population will be divided into clusters at first using cluster sampling, and then at the final stage, subjects will be selected using purposive- random sampling method. 200 subjects will be chosen at random to serve as samples for athletes' support staff. In addition to this, 50 subjects will participate in the pilot study that will allow for a critical evaluation of the first draft.

3.2 Research Design

Any scientific study is organized according to its plan and the structure of every scientific effort is its design. In addition to providing direction, it organizes the research. Given the purpose of the research, a survey design will be employed in the current study.

3.3 Tools

Following statistical tools will be used for the construction and standardization of the comprehensive doping knowledge test.

(A) Difficulty Index: Item difficulty, commonly known as p-value refers to the proportion of examinees that responded to the item correctly. The p-value is calculated using the following formula:

$$p=R/T$$

where p = item difficulty index

R = the number of correct responses to the test item

T= the total number of responses comprises both correct and incorrect responses

The p-value ranges from 0.0 to 1.00. A high p-value indicates an easy item. The interpretation of p value is such that above 0.90 indicate very easy item, 0.62 ideal value and 0.20 indicates very difficult items.

(B) Discrimination Index: The discrimination index differentiates subjects who are knowledgeable and those who are not, meticulously revealing top scorers and low scorers achievement in each item. The value of discrimination index ranges between -1.0 to 1.0.

Item discrimination index (D) is calculated by

$$D= (UG-LG)/n.$$

Where D = discrimination index,

UG = the number of students in the upper group 27% who responded correctly.

LG = the number of students in the lower group 27% who responded correctly

n = number of students in the upper or lower group.

The items will be classified accordingly to their discrimination index with reference to (Ebel, 1972) guidelines. The norms for discrimination index are as follows:

0.40 and above	Very good items
0.30-0.39	Reasonably good but subject to improvement
0.20-0.29	Marginal items usually need and subject to improvement
Below 0.19	Poor items to be rejected or improved by revision

3.4 Nature of Variables

Upon thorough literature review and consultancy with guide, following variables acting as constructs in the study are identified:

1. HISTORY & GENERAL ANTI DOPING AWARENESS
2. ETHICAL UNDERSTANDING
3. HEALTH CONSEQUENCES
4. PROHIBITED DRUGS
5. RULE VIOLATIONS
6. TEST PROCEDURE
7. RESULTS MANAGEMENT PROCESS
8. ATHLETE'S RIGHTS & RESPONSIBILITIES

9. THERAPEUTIC USE EXEMPTIONS
10. VALUE OF FAIR COMPETITION
11. ANTI-DOPING ACT & LEGAL CONSIDERATION
12. PPP - PROTECTION OF PRIVACY & PERSONAL INFORMATION

3.5 Procedure

Methodological Steps for the Construction of Comprehensive Doping Knowledge Test

A large-scale survey's construction takes a gradual and descriptive approach. The entire procedure is split into three phases in order to achieve the study's goals.

Phase- 1 (Preparation of First Draft) :-

Test Blue Print – The test blue print will be prepared keeping in view the content outline and objectives. Aim is to prepare a comprehensive and detailed questionnaire valid in its scope with a concise structure. The item will consist of Multiple-choice questions relating to construct variables listed above. Preparation of initial draft will require in-depth knowledge and experience. Thus, consultation with guide, experts of NADA and objectives statement for anti-doping education will be incorporated altogether.

Trial Run / Pilot Testing - The questionnaire will next be tested after being created to the guide's and scholar's satisfaction, including all necessary information in a systematic manner. By distributing the questionnaire to topic specialists and soliciting their critical analysis of each item, the trial run will serve the purpose of determining the clarity of all statements or questions and the options that correspond to them. They will be fully informed of the study's goals and importance. 50 people will make up the sample size for this. Experts will be asked to critically assess the questions, respond to them with the best of their knowledge, and then return them with any insightful recommendations.

Rewriting - Based on the experts' ideas during the trial run procedure, appropriate revisions to the questionnaire will be made, and the final approval of the guide and committee will be taken into account for finishing the first draft.

Phase – 2 (Administration of First Draft) :-

After rewriting the comprehensive knowledge test items, the first draft will be administered to the actual sample of the current study i.e., Athletes (N = 1000) and Athlete Support Personnel (N = 200) as per their availability and convenience in a laboratory simulating conditions which will be ensured by the researcher.

Phase – 3 (Standardization of the Test) :-

Item Analysis - This phase will consist of carrying out item analysis of the questionnaire through the collected data. Using valid statistical methods for calculating the Difficulty Index and Discrimination Index will help to Retain/Delete items. The retained items will constitute the comprehensive Doping Knowledge Test.

Reliability and Validity – At last, reliability and validity coefficients will be calculated for making it a standard comprehensive doping knowledge test.

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